

City of Issaquah Shoreline Master Program Update Cumulative Impacts Analysis



**Ecology Grant #G0800024
Task 5.1
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I. Background

The City of Issaquah is updating its Shoreline Master Program (SMP) consistent with the Shoreline Management Act (RCW 90.58) and the shoreline guidelines (WAC Chapter 173-26). As part of the SMP update effort, the City is required to evaluate the cumulative impacts of reasonably foreseeable future development to verify that proposed policies and regulations for shoreline management are adequate to ensure ‘no net loss’ of shoreline functions. This memorandum is an analysis of the cumulative impacts that may be expected to occur over time as the proposed SMP is implemented¹. The analysis is required by the City’s Department of Ecology grant (SMA Grant No. G0800024, Task 5) and is intended to support the environmental review of the proposed SMP amendments under the State Environmental Policy Act (SEPA).

Shorelines of the state in the City of Issaquah include approximately six miles of the Mainstem Issaquah Creek, approximately four miles along the East Fork Issaquah Creek, and two miles of the Lake Sammamish shoreline. Two additional miles of Lake Sammamish shoreline located within Lake Sammamish State Park are within the City’s potential annexation area (PAA). For planning purposes, the shoreline planning area is divided into segments or reaches as shown in Table 1 and Figure 1.

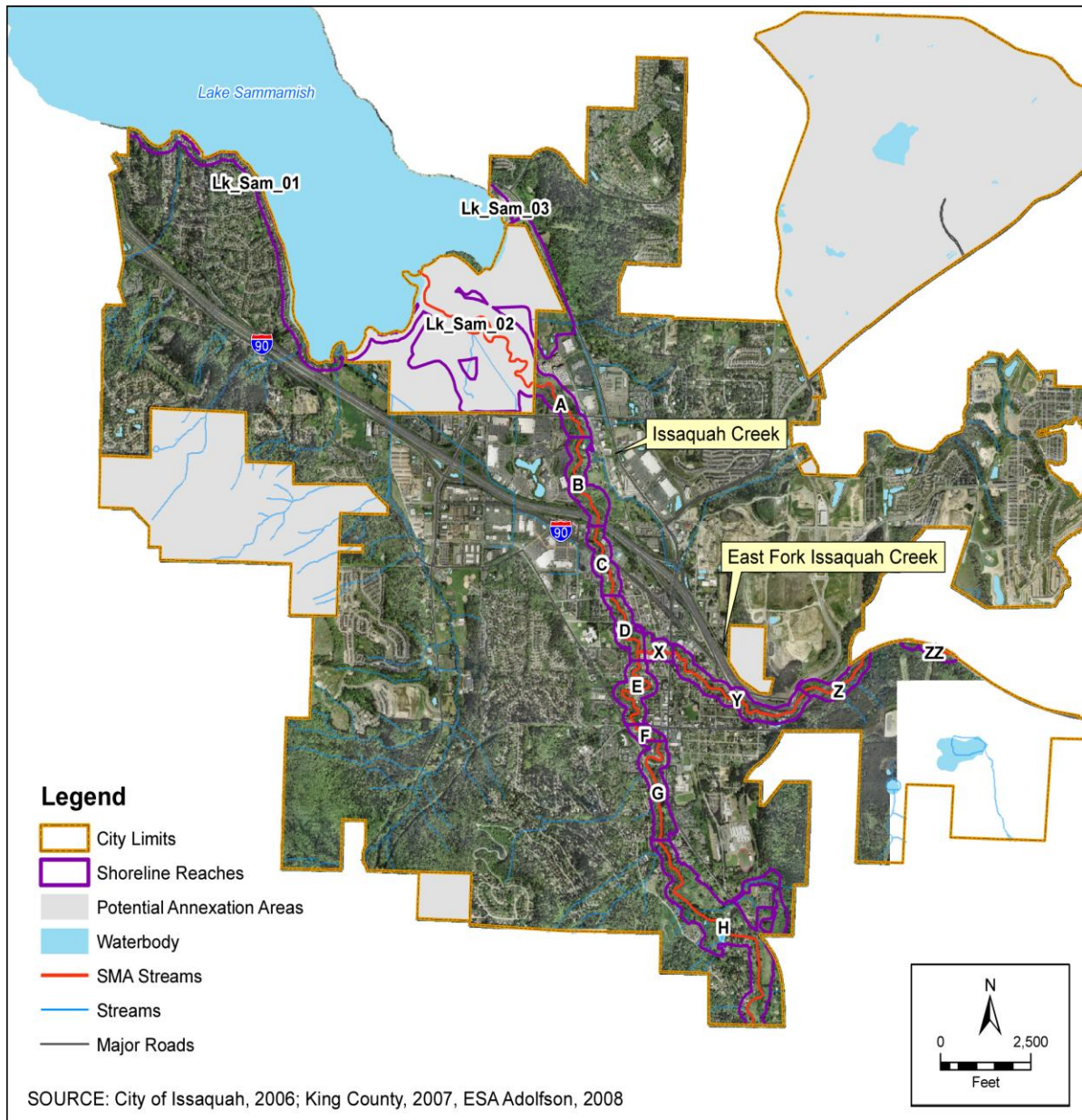
Table 1 Shoreline Planning Areas

| Shoreline | Reaches | General Description | Approximate Area (acres)² | Approximate Percentage of City’s SPA (excluding PAA) |
|--------------------------|---------------------------|--|--|---|
| Mainstem Issaquah Creek | A through H | Stretches from Lake Sammamish State Park Boundary at SE 56 th Street, south to City boundary. | 279 | 39 (63) |
| East Fork Issaquah Creek | X through Z and ZZ | Stretches from confluence with Mainstem Issaquah Creek, east to eastern City boundary near I-90. | 84 | 12 (19) |
| Lake Sammamish | Lk_Sam01 through Lk_Sam03 | Located along the south end of Lake Sammamish. Includes lake shoreline of Greenwood Point Neighborhood and Lake Sammamish State Park PAA. Also includes shoreline of the mainstem Issaquah Creek within Lake Sammamish State Park PAA. | 356 total; 78 within City limits; 278 within PAA | 49 (18) |

¹ The proposed SMP referred to herein is the December 2011 Draft SMP. The cumulative impacts analysis is based on this document. If the goals, policies or regulations of the proposed SMP changed substantially during the public, planning commission, or city council review processes, this analysis may need to be revised accordingly.

² Only includes the upland areas including all known associated wetlands, floodways, and floodplains within 200 feet of floodways based on existing mapping sources. Does not include open water areas or areas below the ordinary high water mark that are also regulated by the SMP.

Figure 1. City of Issaquah River Reaches



The shoreline guidelines state that, “to ensure no net loss of ecological functions and protection of other shoreline functions and/or uses, master programs shall contain policies, programs, and regulations that address adverse cumulative impacts and fairly allocate the burden of addressing cumulative impacts among development opportunities” (WAC 173-26-286(8)(d)). Issaquah’s proposed SMP includes standards and procedures to evaluate individual uses or developments for their potential to impact shoreline resources on a case-by-case basis through the permitting process (See policy 5.6.1.4, and 5.8.1.4. See also regulation 5.6.2.2 requiring mitigation). The purpose of this memorandum is to consider: 1) Current circumstances affecting the shorelines and relevant natural processes; 2) Reasonably foreseeable future development and use of the shoreline; and 3) Beneficial effects of any established regulatory

programs under other local, state, and federal laws.” This assessment uses these three considerations as a framework for evaluating whether the proposed SMP goals, policies and regulations will maintain shoreline ecological functions consistent with current ‘baseline’ conditions. Baseline conditions are identified and described in the City of Issaquah Shoreline Inventory and Characterization Report (ICR) (ESA Adolfson, January 2009). Another purpose of the cumulative impacts analysis is to assess the ecological functions at risk.

II. Current Circumstances and Relevant Processes

The City’s Shoreline Inventory and Characterization Report (ESA Adolfson, 2009), Shoreline Restoration Plan, Land Use and Public Access Memorandum, and report on Recommended Actions for Translating the Inventory and Characterization Findings into SMP Policies and Regulations provide a comprehensive description of Issaquah’s shorelines. The documents identify existing shoreline conditions, describe relevant shoreline functions, and characterize ecosystem processes at a watershed scale. This section provides a brief summary of the detailed information contained in those documents.

1. Watershed Context

The City of Issaquah lies entirely within the Lake Sammamish watershed. The majority of the City drains to Issaquah Creek, with smaller areas draining either directly to Lake Sammamish or through the East Lake Sammamish basin. Issaquah Creek is the single largest tributary flowing into the lake, draining the slopes of Cougar, Tiger, and Squak Mountains north to the lake. The stream network begins around 3,000 feet above sea level, and flows down to the lake at around 30 feet above sea level.

The Issaquah Creek basin covers approximately 61 square miles and includes four major branches: Tibbetts Creek to the west, the Mainstem to the south, and the North and East Forks of Issaquah Creek to the east. Approximately 15 percent of the Issaquah Creek basin lies within City boundaries. Lands in the upper basin are primarily zoned for forestry and rural residential uses. As of 2001, 30 percent of the basin was zoned forest production, 12 percent was within the urban growth boundary, and the remaining 58 percent was zoned rural. Over 40 percent of the land is in public ownership with Washington Department of Natural Resources, Washington State Parks, King County Parks, and City of Issaquah Parks. The population in the basin is projected to increase by 18 percent by 2020 (<http://green.kingcounty.gov/WLR/Waterres/StreamsData/WaterShedInfo.aspx?Locator=0631#specialstudies>).

The City of Issaquah is located at the downstream end of the basin on the valley floor between the steep hillsides of Tiger, Squak and Cougar Mountains and the southern end of Lake Sammamish. Most of the City’s early development was located on the valley floor, where historic downtown Issaquah is located. Today the downtown area has limited ability to accommodate new development; most of the new development has occurred on the adjacent foothills.

The Issaquah Creek basin is one of the three most significant basins in King County in terms of salmon production and the upper and middle portions of the basin are a Regionally Significant Resource Area because of the exceptional fisheries habitat and undeveloped character (Kerwin, 2001). Eight species of salmonids use the Issaquah basin including an early-run kokanee stock.

The Issaquah Creek basin includes valuable wildlife habitat including approximately 2,827 acres of inventoried wetlands (roughly 6.2% of the basin area). Some of most valuable wetlands are located in the lower basin inside the City limits. Approximately 285 acres of wetland have been mapped in the City of Issaquah; approximately 82 acres of wetlands (11 individual wetlands) occur within the City's shoreline zone (Parametrix, 2003). Many of the wetlands in the lower basin provide important habitat for wetland-associated species and perform water quality functions related to nutrient removal (i.e., denitrification). One example is the wetland complex at the downstream end of Issaquah Creek near Pickering Place. Wetlands in the upper basin may help attenuate downstream peak flows and supplement baseflows.

2. Land Use and Public Access

The land use pattern adjacent to Issaquah Creek, the East Fork, and Lake Sammamish is a mix of residential housing (primarily low and moderate density), commercial development (primarily in the downtown area), and open space. The existing land use pattern matches the City's zoning designations relatively closely.

The Mainstem Issaquah Creek shoreline planning area includes low-density residential development and vacant land as the two dominant land uses in terms of area, 30 and 34 percent, respectively. Approximately 9 percent of the Mainstem Issaquah Creek shoreline area is categorized as open space. Commercial and multi-family land uses make up 7 percent each. Lands dedicated to transportation comprise approximately 10 percent of the Mainstem Issaquah Creek shoreline planning area.

The Interstate 90 right-of-way dominates the East Fork shoreline zone. Approximately 59 percent of the total East Fork shoreline planning area consists of transportation uses. Transportation makes up 25, 56, 64, and 99 percent of the shoreline planning area in Reaches X, Y, Z, and ZZ respectively.

Existing land use within the Lake Sammamish shoreline planning area (excluding Lake Sammamish State Park) is predominantly low-density residential (45 percent) and commercial/retail (24 percent) with the remainder in parks and open space (9 percent) and transportation (12 percent).

Water-oriented Uses

Water-oriented uses, as defined by WAC 173-26-020, are scarce in Issaquah. There are currently only two water-dependent uses within the City: the WDFW Issaquah Fish Hatchery (Issaquah Creek Reach F) and the public boat launch in Lake Sammamish State Park (Reach Lk_Sam03). There are limited opportunities for new water-dependent and -related uses on Issaquah Creek and the East Fork because the creeks are too small to support water transport, marina development, or water-oriented commercial or industrial operations such as boat yards, boat repair, or commercial fishing. Water-dependent and water-related uses are unlikely to fit in with the established patterns of single-family development, retail development, and open space along the Mainstem and the East Fork shorelines.

There are limited opportunities for water-dependent and water-related used on the Lake Sammamish shoreline because the majority of the shoreline planning area (excluding the State Park) is platted and fully developed for single-family residential use.

Public Access

The City of Issaquah has a relatively large amount of publicly owned land that offers both visual and physical access to the City's shorelines. Parks and open spaces that are adjacent to or partially within the shoreline planning area encompass approximately 711 acres (198 acres excluding Lake Sammamish State Park). In addition, the Pickering Trail and the Hatchery Dam Trail are within the shoreline planning area. The Pickering Trail is a multiple use trail that extends approximately three-quarters (3/4) of a mile south from Pickering Farm (Reach A) along Issaquah Creek to Emily Darst Park, where it links to the East Lake Sammamish Regional Trail (Reach B). The Hatchery Dam Trail (Reach G) extends south from Mine Hill Park along the eastern shore of Issaquah Creek.

3. Relevant Natural Processes and Ecologic Functions

Issaquah's shorelines are influenced by processes that operate at the scale of the entire basin as well as at the local shoreline scale. Development actions throughout the basin and along the shoreline have disrupted water flow, water quality (e.g., denitrification), and sediment and nutrient delivery processes, altering shoreline conditions to varying degrees. This section describes the ecological conditions that are the result of natural processes as well as the alterations to those processes that have occurred due to urban development in Issaquah.

Mainstem Issaquah Creek

Development in the basin and along the Mainstem Issaquah Creek has altered the natural stream flow regime and decreased channel bank stability. Flow regimes have changed because of increases in impervious surface (roadways, buildings, driveways, parking lots, etc), which disrupt the natural entry of water into the soil, thereby increasing the rate and altering the timing/duration of stormwater runoff. The increased runoff has scoured the channel and simplified stream morphology, making the stream less suitable and desirable for fish and wildlife. Increases in impervious surface have also contributed to overbank flooding and bank erosion. To counteract this, channel banks have been extensively armored or hardened to prevent erosion and protect adjacent land and structures. Bank armoring and confinement have reduced channel complexity, decreased floodplain connectivity, and caused higher flow velocity and water depths. The Mainstem lacks significant woody debris needed for forming pools used by salmonid species for holding and rearing habitat. The lack of a well vegetated riparian corridor limits the ability of the stream to recruit new woody material over time. Lack of riparian vegetation also allows increased water temperature. As a result, habitat conditions for salmon in Issaquah Creek (Mainstem and East Fork) are 'At Risk' or 'Not Property Functioning' (Parametrix, 2003), as summarized in Table 2 below. The *Shoreline Inventory and Characterization Report* provides detailed information on instream and riparian habitat conditions in Section 4.1.3.2.

Most of these problems are concentrated in the lower reaches of the creek where urban density is highest. With some exceptions, the lower reaches of the Mainstem shoreline, which include the City's central business district, are largely built out. The relatively high level of shoreline development and bank modification in these areas will be a constraint to maintaining or improving ecological functions.

Ecological conditions in Lake Sammamish State Park and in the upper reaches of the Mainstem, where development is less intense and public open spaces are more common, are somewhat better. In these areas,

bank conditions are more natural, the riparian corridor is more intact, and the creek remains more connected to its floodplain.

Table 2 Mainstem Issaquah Creek Habitat Conditions Summary by Reach
(Data from Parametrix, 2003)

| Pathway | Indicator | Reach | | | | | | | |
|--------------------------------|-------------------------|-------|---|---|---|---|---|---|---|
| | | A | B | C | D | E | F | G | H |
| Water Quality | Temperature | ◆ | ◆ | ◆ | ◆ | ◆ | ◆ | ◆ | ◆ |
| | Sediment/TSS | ● | ● | ● | ● | ● | ● | ● | ● |
| | Chemicals | ◆ | ◆ | ◆ | ◆ | ◆ | ◆ | ○ | ○ |
| Habitat Access | Physical Barriers | ○ | ○ | ○ | ○ | ○ | ◆ | ◆ | ○ |
| Habitat Elements | Substrate | ◆ | ◆ | ● | ● | ● | ● | ● | ● |
| | Large Woody Debris | ● | ● | ● | ● | ● | ● | ● | ● |
| | Pool Frequency | ● | ● | ● | ● | ● | ● | ● | ● |
| | Pool Quality | ◆ | ◆ | ◆ | ◆ | ◆ | ● | ● | ◆ |
| | Off-channel Habitat | ◆ | ● | ● | ◆ | ◆ | ● | ● | ● |
| Channel Condition and Dynamics | Bank Condition | ○ | ○ | ◆ | ○ | ● | ◆ | ◆ | ○ |
| | Floodplain Connectivity | ◆ | ◆ | ● | ◆ | ● | ● | ● | ● |
| Flow/Hydrology | Change in Peak flows | ● | ● | ● | ● | ● | ● | ● | ● |
| | Change in Base flows | ◆ | ◆ | ◆ | ◆ | ◆ | ◆ | ◆ | ◆ |
| Watershed Condition | Road Density | ◆ | ◆ | ◆ | ◆ | ◆ | ◆ | ◆ | ◆ |
| | Riparian Reserves | ● | ● | ● | ● | ● | ● | ● | ● |

○ Properly Functioning

◆ At Risk

● Not Properly Functioning

East Fork

Ecological conditions along the East Fork are similar to those described for the Mainstem Issaquah Creek. Direct alterations to the East Fork appear to be more extensive due to the past use of the channel as a log flume, construction associated with I-90 and the Sunset Interchange, and urban development. Conditions in upper reaches (Z and ZZ) differ significantly from those of the lower reaches (X and Y). The lower reaches have a higher percentage of impervious surface due to past and recent urban development. As a result, the instream and riparian habitat conditions are highly altered. The banks of the lower reaches are armored and the stream is channelized. The result is a lack of floodplain connection, a lack of off-channel habitats, and a lack of pool habitat. Banks in the lower reaches are often infested with Himalayan blackberry with limited riparian overstory and limited potential for recruitment of wood. Table 3 below summarizes habitat conditions by shoreline reach for the East Fork Issaquah Creek. The *Shoreline Inventory and Characterization Report* provides detailed information on instream and riparian habitat conditions in Section 4.2.3.2.

Table 3 East Fork Issaquah Creek Habitat Conditions Summary by Reach
(Data from Parametrix, 2003)

| Pathway | Indicator | Reach | | | |
|--------------------------------|-------------------------|-------|---|---|------|
| | | X | Y | Z | ZZ * |
| Water Quality | Temperature | ○ | ○ | ○ | ○ |
| | Sediment/TSS | ○ | ○ | ○ | ○ |
| | Chemicals | ○ | ○ | ○ | ○ |
| Habitat Access | Physical Barriers | ○ | ○ | ○ | ○ |
| Habitat Elements | Substrate | ◆ | ◆ | ● | ● |
| | Large Woody Debris | ● | ● | ● | ● |
| | Pool Frequency | ● | ● | ● | ● |
| | Pool Quality | ● | ◆ | ● | ● |
| | Off-channel Habitat | ● | ● | ◆ | ◆ |
| Channel Condition and Dynamics | Bank Condition | ◆ | ◆ | ○ | ○ |
| | Floodplain Connectivity | ● | ● | ◆ | ◆ |
| Flow/Hydrology | Change in Peak flows | ● | ● | ● | ● |
| Watershed Condition | Road Density | ◆ | ◆ | ◆ | ◆ |
| | Riparian Reserves | ● | ● | ● | ● |

○ Properly Functioning

◆ At Risk

● Not Properly Functioning

* Evaluation of Reach ZZ was not included in the 2003 Stream Inventory. Based on review of aerial photography and PHS data, it appears that conditions in Reach ZZ are similar to those described for Reach Z.

Lake Sammamish

Like the Mainstem and East Fork of Issaquah Creek, Lake Sammamish is affected by development along the shoreline and in the contributing basin. Water quality in the lake is relatively good, but altered water flow and sediment delivery processes and increased nutrient inputs associated with urban land use practices threaten to alter the lake's trophic status.

Shoreline modifications (including bulkheads, docks, and structures built close to the water) are a significant concern along Lake Sammamish (Table 2). The proliferation of residential docks, piers, and bulkheads along the lakeshore has reduced the quality and accessibility of rearing and migratory habitat for juvenile salmonids and other species. Much of the dense woody and emergent vegetation that once lined the Lake Sammamish shoreline has been replaced by manicured lawn, which reduces woody debris, overhanging vegetation, and detrital inputs that salmon and other aquatic organisms rely upon.

In general, these shoreline modifications create a suite of physical, biological and chemical responses, including:

- Reduced primary productivity due to shading (docks);

- Altered predator-prey interactions in a manner that favors salmonid predators;
- Modified shoreline configuration;
- Increased chemical inputs;
- Loss of shallow water habitat which is an important migratory pathway for juvenile fish;
- Loss of natural shoreline vegetation and reduced organic inputs (terrestrial insects and detritus); and
- Decreased habitat complexity due to loss of rootwads, overhanging vegetation and undercut banks.

Recreational use of Lake Sammamish also threatened to disrupt process and functions. Potential impacts include spreading exotic species of plants and plankton, noise impacts to fish and wildlife, increased wave energy and shoreline erosion, direct physical injury due to contact with people and watercraft, re-suspension of contaminated sediments and/or increased turbidity caused by propeller scour, and possible introduction of chemical pollutants from boat emissions. The following table summarizes existing Lake Sammamish shoreline modifications. Further information is provided in Section 4.3.4.7 of *The Shoreline Inventory and Characterization Report*.

Table 4 Summary of Lake Sammamish Shoreline Modifications

| Category | Lk_Samm01 | | Lk_Samm02 | | Lk_Samm03 | |
|--|--------------|------------|--|------------|--------------|------------|
| | # of parcels | % of total | # of parcels | % of total | # of parcels | % of total |
| Total parcels | 128 | 100 | 3 | 100 | 5 | 100 |
| Parcels with private residential docks | 110 | 86 | Not applicable: Lk. Sammamish State Park contains a major public boat ramp facility and no other docks | | 3 | 60 |
| Parcels with joint use residential docks | 7 | 5 | | | 1 | 20 |
| Parcels with hard shoreline armoring | 88 | 69 | 0 | 0 | 1 | 20 |
| Parcels with moderate shoreline armoring (no bulkhead, some vegetation and/or areas of natural vegetation) | 35 | 27 | 2 | 66 | 3 | 60 |
| Parcels with natural (unmodified) shorelines | 5 | 4 | 1 | 33 | 1 | 20 |
| Parcels with building setback of less than 50 feet | 65 | 51 | 0 | 0 | 0 | 0 |

III. Reasonably Foreseeable Future Development

Reasonably foreseeable future development on Issaquah's shorelines is likely to maintain the existing land use patterns described above. According to the Comprehensive Plan, the City is expected to grow from a 2007 population of 24,710 to 29,199 by 2022. Growth in population and jobs is likely to spur new

residential and some commercial development in Issaquah. Much of this growth will occur outside of the City's shoreline jurisdiction—in the Issaquah Highlands and Talus subdivisions and in future annexation areas. A relatively small percentage of the expected growth is likely to occur within the shoreline planning area because there is relatively little undeveloped land available in shoreline jurisdiction.

1. Potential for New Development and Redevelopment

Most parcels on the Lake Sammamish, Mainstem and East Fork Issaquah Creek shorelines have an existing residence or office/retail establishment depending on whether the zoning is residential or commercial. As a result, opportunities for new shoreline development (on undeveloped lots) are limited and most future development activity would be redevelopment or expansion of existing development.

The City of Issaquah has actively acquired shoreline properties over the last couple decades to protect as natural open space and passive park area. Within the shoreline area of the mainstem Issaquah Creek, approximately 128 acres is owned by the City or other government agencies, representing approximately 43% of the total shoreline area. Another 8% of the shoreline area is within existing right-of-way. Therefore, approximately 49% of the total shoreline area is privately owned, 9.7 % of the total shoreline area is vacant, undeveloped land and 17% is redevelopable.¹

The Urban Conservancy shoreline environment designation is applied to shoreline areas that are relatively undisturbed compared to other shoreline areas in the City, with retained riparian vegetation and minimal bank armoring. It's also applied to lower density and less developed residential areas, concentrated in the the upper Mainstem reaches (Reaches G and H). In Reaches G and H, approximately 53.5% of the land is government-owned and about 32% is privately-owned vacant or redevelopable land. The vacant parcels will likely convert to single-family residential developments consistent with current zoning (mostly Single-family Suburban – 4.5 dwelling units/acre in Reach H and Single-family Small Lot – 7.26 dwelling units/acre in Reach G). There is an area of multi-family zoning in the Urban Conservancy designation, in the lower Mainstem reaches A and B. The SMP requires a 200-foot buffer for multi-family development in the Urban Conservancy designation.

Redevelopment of existing lots, including expansion of existing structures, is likely to account for the majority of future development activity. For example, Reach Y on the East Fork is primarily zoned Single-family Duplex (SF-D) and is mostly developed with single-family residences. There is redevelopment potential with the single-family properties eventually redeveloping with duplexes. The proposed SMP contains provisions to address both new development and redevelopment to ensure that existing conditions are maintained, or preferably improved, over time (see discussion below under Potential for Cumulative Impacts).

¹ Redevelopment potential is any privately owned parcel that is 1 acre or larger presently developed with one single-family home.

2. Potential for Future Shoreline Modifications

Future development is not likely to result in significant numbers of new docks/floats/lifts or shoreline bulkheads. As reported in Table 3, the vast majority of the lots of Lake Sammamish already have a dock/float/lift and/or some type of modified or armored shoreline. Some of these structures will be repaired or replaced over time, but the number of new modifications on the lakeshore will be very small.

There are no docks/piers/floats on Issaquah Creek and none are expected in the future. The proposed SMP prohibits these types of moorage structures and it is very unlikely that anyone would attempt to construct a dock, lift or float given the small size of the creek and limited potential for boating or swimming. The banks of the creeks are extensively armored with riprap. Some of this armoring will likely need to be repaired or replaced but the potential for extensive new armoring where armoring does not presently exist is very low (the proposed SMP has stringent criteria that limit approval of new bank stabilization; see discussion below under Potential for Cumulative Impacts).

Table 5 Potential for New Development and/or Redevelopment

| Shoreline Location | New Development Potential | Redevelopment Potential |
|---------------------------------|---|---|
| Mainstem Issaquah Creek | | |
| Reach A and B | Potential is moderate. Several large undeveloped lots, zoned for commercial, single- and multi-family development on the right bank, represent opportunities for new infill development. | Existing residential and commercial structures could be modified or expanded. |
| Reaches C - F | Potential is low. Most parcels have an existing residence or commercial establishment depending on whether the zoning is residential or commercial. Opportunities for new development are limited. | Existing residential and commercial structures could be modified or expanded. |
| Reaches G and H | Potential is low. Vacant lands likely to be developed as new single and multi-family residential consistent with current zoning. Larger lots could be subdivided. | Existing residential and commercial structures could be modified or expanded. |
| East Fork Issaquah Creek | | |
| Reach X | Potential is low. Most parcels have an existing residence or office/retail establishment consistent with current zoning or are City owned park land. Opportunities for new commercial/residential development are very limited. | Existing residential and commercial structures could be modified or expanded. |
| Reach Y | Potential is low. Most parcels have an existing residence or office/retail establishment depending on whether the zoning is residential or commercial. Limited opportunity for new development as single family developments are converted to duplex development. | Existing residential or commercial structures could be modified or expanded. |
| Reach Z and ZZ | Potential is low. Highway right-of-way is developed. Development in the NRCA is prohibited. | Existing highway infrastructure could be developed to accommodate safety and/or capacity improvements. |
| Lake Sammamish | | |
| Reaches Lk_Samm01 and Lk_Samm03 | Potential is low. Limited to single family residential development. Only a handful of undeveloped lots so the potential for new homes, docks, and/or bulkheads on the lakeshore is very low. | Future development activity on the lakeshore will most likely involve expansion/remodeling of existing homes, replacement of existing private docks, and repair/replacement of residential bulkheads. |
| Reaches Lk_Samm01 | State Park – New development would primarily be for water oriented- recreation and non-water-oriented recreation (i.e., ball fields). | Mainly maintenance of existing park facilities. |

3. Potential for New Impervious Surface

The amount of existing impervious surface area in SMP jurisdiction varies by shoreline reach, but the percentages are relatively high for most reaches outside of the State Park (Lk_Samm01)(Table 4). The potential for new impervious surface is related to the potential for new development, so although the percentages will likely rise in some areas, it is unlikely there will be a substantial increase overall. Reaches that currently have minimal impervious surface (A, B, and H) contain extensive wetland areas and are not likely to be developed to the full extent allowed by zoning because of existing regulations that limit wetland fill.

Redevelopment activities are not expected to substantially increase the existing impervious surface percentages for two reasons: 1) the City would require major redevelopments to meet the current thresholds for impervious surface which are generally lower than what was allowed when the properties were originally developed, and 2) the City provides incentives for removal of impervious surface. The SMP includes specific provisions to protect shorelines from impacts associated with impervious surface and runoff from developed properties and to ensure that their ecological functions are maintained (see discussion below under Potential for Cumulative Impacts).

Table 6 Impervious Surface Percentages

| Shoreline Reach | Shoreline Planning Area ³ (Acres) | Impervious Area (Acres) | Percent Impervious |
|-----------------|--|-------------------------|--------------------|
| A | 26 | 3 | 13 |
| B | 31 | 2 | 7 |
| C | 21 | 10 | 46 |
| D | 21 | 4 | 18 |
| E | 26 | 8 | 32 |
| F | 7 | 4 | 61 |
| G | 31 | 8 | 26 |
| H | 117 | 7 | 6 |
| X | 10 | 4 | 39 |
| Y | 45 | 12 | 27 |
| Z/ZZ | No data | | |
| Lk_Samm01 | 45 | 19 | 42 |
| Lk_Samm02 | 306 | 51 | 1 |
| Lk_Samm03 | 5 | 2 | 44 |

³ Only includes areas landward of the ordinary high water mark..

IV. Beneficial Effects of Established Regulatory Programs

A variety of regulatory established programs work in concert with the City's SMP to protect shoreline resources and regulate development near the shoreline. Key local, state, and federal regulations that help to achieve the goal of no net loss are summarized below.

1. Local Regulatory Programs

All development activity within the water or on the lands adjacent to Issaquah Creek, the East Fork, and Lake Sammamish is required to comply with the Issaquah Municipal Code (IMC). Sections of the IMC that are most relevant to shoreline management are the zoning code (IMC 18.06), stormwater code (IMC 13.28), erosion and sediment control provisions (IMC 16.30), and the environmentally critical areas ordinance (IMC 18.10.340 – 18.10.930, also known as the CAO). The following are descriptions of relevant the local regulations:

- IMC 18.06 – Zoning. Establishes zoning districts and regulates land use in the City including the shorelines.
- IMC 18.10.340 – 18.10.930 – Environmentally Critical Areas. Establishes policies, regulations and land use controls to protect critical areas, including streams, wetlands, steep slopes, aquifer recharge areas, as well as erosion, flooding, landslides, and seismic hazard areas consistent with the State's Growth Management Act (GMA). The City's CAO regulates placement of fill in wetlands and requires buffers on wetlands and streams. The CAO requires a 100-foot-wide buffer on both the Mainstem and East Fork of Issaquah Creek. Wetland buffer requirements range from 40 feet for Category IV wetlands to 225 feet for Category I wetlands, depending on the wetland category and wetland rating habitat function score. The City's current wetland buffer requirements were adopted in 2006 as part of the Best Available Science review and are consistent with State Department of Ecology (DOE) guidelines from *Wetlands in Washington State, Volume 2: Guidance for Protecting and Managing Wetlands, April 2005*. As part of the SMP update, stream and wetland buffer standards in the CAO have been amended to clarify that buffer reductions and encroachments are limited to a maximum of 25% of the standard wetland/stream buffer width.
- IMC 13.28 – Stormwater Management. Establishes policies and regulations for the comprehensive management of surface and stormwater, erosion control, and flooding. The regulations require all new developments to use water quality treatment and flow control best management practices to reduce impacts associated with stormwater entering the City's waterbodies.
- IMC 16.26 – Clearing and Grading. Regulates land alteration, particularly the clearing and grading of land in the City. Provides development regulations and construction procedures for ensuring that land clearing protects the natural qualities of lands and watercourses within the City.
- IMC 16.27 - Tree Preservation. Establishes regulations for the removal and/or alteration of trees in the City with the goals of retention, protection, and proper maintenance of specified trees.

- IMC 16.30 – Erosion and Sediment Control. Established regulations to control, limit, and manage erosion and sedimentation to protect and maintain the hydrologic balance of watersheds and watercourses, preserve wildlife and aquatic habitat and to protect the life and property of individuals. Requires preparation of an erosion and sediment control plan for all grading, filling, and excavation activities.

State and Federal Programs

In addition to complying with City regulations, development activity within the City's shoreline jurisdiction is subject to a number of state and federal regulations. Development proposals that could impact wetlands, lakes or streams; affect fish and wildlife listed under the federal Endangered Species Act (ESA); result in over one acre of clearing and grading; affect the floodplain or floodway; or involve construction in or over waterbodies such as lakes and streams require compliance with state or federal regulations.

- Hydraulic Project Approval (HPA) – The HPA program, which is administered by the Washington State Department of Fish and Wildlife (WDFW), applies to any construction activity in or near the waters of the state. HPAs control the timing of in-water work and dictate the type, size, configuration and materials for all in-water structures including residential docks, piers, and boat launches/lifts on Lake Sammamish and culverts, bridges, and other structures on Issaquah Creek and the East Fork. This helps to ensure that authorized activities do not adversely impact fish and wildlife resources, which is consistent with the goal of no net loss.
- NPDES Phase II Stormwater Permitting – The City is regulated under the Washington State Department of Ecology's Western Washington Phase II Municipal Stormwater Permit (Permit). This permit contains various requirements for stormwater management and operations that must be implemented over the 5-year permit ending February 15, 2012. The permit broadly applies to many City activities that involve maintenance and operations of City facilities, permitting of new public and private development, inspections and enforcement of water quality regulations, and other activities. To meet the conditions of the permit, a Stormwater Management Program (SWMP) has been prepared. The SWMP outlines all requirements of the permit and a summary of the City's work program to meet those requirements over the 5-year permit term, and will be updated annually to incorporate progress on implementing the SWMP and changes to projected future work efforts. Compliance with the NPDES Phase II requirements will involve retrofitting areas without adequate stormwater detention, implementing low impact development techniques, and other measures to reduce peak flows, flooding, stream scour, bank erosion, water quality degradation and other issues identified in the ICR.
- Federal Clean Water Act – Section 404 of the Federal Clean Water Act (USC 1394) regulates the discharge of dredged or fill material into waters of the United States. Any project that discharges dredged or fill material into a water of the United States, including streams, lakes and wetlands, requires a Section 404 permit from the U.S. Army Corps of Engineers (Corps). The Corps requires applicants to avoid and minimize impacts and compensate for unavoidable impacts by replacing wetlands or enhancing existing wetlands. These requirements help achieve the goal of no

net loss of wetland and aquatic resources and play a direct role in supporting the goals of the SMP. Applicants receiving a Section 404 permit from the

- U.S. Army Corp of Engineers, a Coast Guard permit or license from the Federal Energy Regulatory Commission (FERC), are also required to obtain a Section 401 water quality certification from the Department of Ecology (Ecology). Issuance of a certification means that Ecology anticipates that the applicant's project will comply with state water quality standards and other aquatic resource protection requirements under Ecology's authority. By complying with these requirements, development projects avoid and minimize adverse effects on water quality and other beneficial uses of the state's waters.
- Washington State Water Pollution Control Act – All projects effecting surface waters in the state, including those that are not subject to the Federal Clean Water Act sections 404/401 must still comply with the provisions of the State's Water Pollution Control Act (RCW 90.48).
- Federal Endangered Species Act (ESA) – All projects that trigger the need for a federal permit or use federal funding are subject to environmental review under the ESA. The U.S. Fish and Wildlife Service (USFWS) and the National Oceanic and Atmospheric Administration Fisheries service (NOAA Fisheries) administer the ESA Section 7 compliance process. These agencies must verify that federal projects will not jeopardize any fish or wildlife species listed as endangered or threatened. The USFWS and NOAA require projects to implement specific conservation measures to protect listed species. This helps ensure that shoreline developments will not impact threatened Chinook salmon in Lake Sammamish and Issaquah Creek.
- Federal Rivers and Harbors Act Section 10 – The purpose of Section 10 is to prohibit the obstruction or alteration of navigable waters of the U.S. Like the state's HPA program, this law regulates the size, location, configuration, and materials used to construct (or reconstruct) docks, floats, boat lifts and other inwater structures. The law sets maximum dimensional standards for docks and lifts on Lake Sammamish and requires that docks be constructed of materials that allow light penetration. Before issuing a Section 10 Permit, the Corps of Engineers must coordinate with the USFWS and NOAA to ensure that the proposed project will not impact federally listed species. The law also requires mitigation for impacts of new or reconstructed docks and lifts.
- The proposed SMP also includes specific dock standards for dock length, area, width, height, and light penetration, which effectively prevents these structures from having significant adverse impacts on shoreline functions. The proposed SMP allows the City to approve modifications to the SMP standards provided an applicant demonstrates an alternative project design has been approved by the U.S. Army Corps of Engineers and Washington State Department of Fish and Wildlife.

V. Potential for Cumulative Impacts

This section describes how the proposed SMP protects shoreline functions and processes to prevent cumulative adverse impacts and achieve no net loss. Appendix A cites specific provisions in the proposed

SMP and Draft Restoration Plan (ESA Adolfson, 2009) that serve to protect and enhance shoreline ecological functions. For each shoreline use, Appendix A provides the current conditions, potential future changes, existing regulatory controls, and an assessment of expected future performance.

1. General Strategies for Addressing Cumulative Impacts

The proposed SMP uses the following general strategies to prevent cumulative impacts:

- Applying shoreline environment designations (SEDs) based on the existing shoreline conditions and managing each area according to applicable management policies for each designation,
- Application of shoreline use and modification policies and regulations to achieve no net loss of ecological functions,
- Requiring proponents of development to avoid, minimize, and then compensate for impacts in accordance the State's recommended mitigation sequence, and
- Integrating the City's critical areas regulations into the shoreline program, so that critical areas in shoreline jurisdiction receive an equivalent level of protection as that afforded to critical areas outside shoreline jurisdiction.

Shoreline Environment Designations

The Proposed SMP uses a system to classify shoreline areas into specific "environment designations." The purpose of shoreline environment designations is to provide a uniform basis for applying policies and use regulations within distinctly different shoreline areas. The SEDs are assigned to shore segments based on three general factors:

- The ecological condition of the shoreline,
- The extent and degree of shoreline modification, and
- The type and intensity of existing land use.

In Issaquah specific consideration was given to the following ecological and land use attributes:

- Degree of ecological function (characterized as properly functioning, at risk, not properly functioning conditions in the ICR),
- The percentage of shoreline affected by bulkheads, riprap, docks, and other modifications,
- Riparian cover and composition,
- Zoning designation (parcel size, etc.), and
- The density and intensity of existing use and potential for new development and/or redevelopment.

The environment designations proposed in the SMP are generally consistent with the State guidelines (WAC 173-26-211) and are appropriate for Issaquah (Table 5). Each designation has specific policies and regulations geared toward protecting the existing shoreline conditions and accommodating future uses that are compatible with existing uses and with the comprehensive plan. For example, the policies for the Shoreline Commercial / Mixed Use and Transportation High Intensity designations are targeted toward

areas with intensive urban uses and they encourage redevelopment that contributes to improvement of shoreline ecological functions or provides public access. New developments in areas designated Shoreline Commercial / Mixed Use and Transportation High Intensity must include restoration of riparian processes to improve streamside vegetation, in-stream habitat complexity, water quality, bank stability, and/or other desirable shoreline attributes. This will help ensure that future land uses will be compatible with existing uses and with the City's comprehensive plan.

Table 7 Summary of Proposed Shoreline Environment Designations

| Proposed SED | Assignment Criteria | Where Applied |
|--|--|---|
| Shoreline Commercial / Mixed Use | <ul style="list-style-type: none"> High intensity commercial use and multifamily or mixed use development High levels of shoreline armoring Impaired riparian functions, and/or low quality in-stream habitat | Occurs along Issaquah Creek, primarily within the downtown area (Reaches C and F) and along the East Fork near the confluence with the Mainstem (Reach X). |
| Transportation High Intensity | <ul style="list-style-type: none"> Areas within the City boundary and PAA that are currently within the WSDOT right-of-way | On the East Fork Issaquah Creek within the Interstate-90 right-of-way (Reaches Y, Z and ZZ). |
| Lake Sammamish Shoreline Residential and Issaquah Creek Shoreline Residential | <ul style="list-style-type: none"> Relatively Dense single Family Residential Uses Moderate/High Shoreline Armoring Degraded Ecological Functions Numerous Overwater Structures | <p>All of the Lake Sammamish shoreline outside of the State Park (Reach Lk_Samm01 and Lk_Samm03) excluding parks.</p> <p>Middle reaches of the Mainstem (Reach E) and East Fork (Reach Y).</p> |
| Issaquah Creek Urban Conservancy and Lake Sammamish Urban Conservancy | <ul style="list-style-type: none"> Parks and open spaces Low-/Moderate-Density Residential Intact/Partially Intact Riparian Vegetation Limited Shoreline Armoring | <ul style="list-style-type: none"> Downstream and upstream reaches of the Mainstem (Reaches A and B and G and H, respectively). Middle reach of Mainstem (Reach D) just below confluence with the East Fork and small portion of Reach X on the East Fork. |
| Natural | <ul style="list-style-type: none"> Undisturbed Natural Areas Intact Riparian/Shoreline Vegetation Restricted Development Potential | <ul style="list-style-type: none"> Portion of the East Fork shoreline within the Tradition Plateau NRCA (Reach Z) |

2. Mitigation Requirements and Integration of Critical Areas Regulations

The SMP includes overarching policies and regulations to prevent cumulative impacts. The following overarching policies apply to all shoreline uses and development:

- 5.6.1.1. The City should preserve, enhance, and/or protect critical areas in shoreline jurisdiction for their ecological functions and values, as well as their aesthetic, scenic, and educational qualities.

- 5.6.1.2. This Program should provide a level of protection to critical areas within the shoreline that is at least equal to the standards provided in the City’s critical area regulations, adopted pursuant to the Growth Management Act.
- 5.6.1.3. All shoreline use and development should avoid and minimize adverse impacts to ensure no net loss of ecological functions and processes from current conditions. Shoreline ecological functions that should be protected include hydrology, water quality, riparian habitat, and in-stream habitat functions. Shoreline processes that should be protected include surface and groundwater flow, channel migration, sediment delivery, water quality and organic inputs.
- 5.6.1.4. Project-specific and cumulative impacts should be considered in assessing the potential for net loss of ecological functions and processes.
- 5.6.1.5. The City should require mitigation proportionate and related to the expected impacts of the proposed development.

The SMP includes regulations that implement each one of these important policies. For example, all developments and uses must adhere to the City’s wetland and stream buffer requirements in the critical areas regulations and must mitigate impacts in accordance with the mitigation sequence prescribed in WAC 173-26-201(2). The SMP requires mitigation proportionate to the scale and expected impacts of proposed development. This is particularly important because most of the shoreline area is currently developed and it’s anticipated that most development activity will entail expansions/additions to existing structures and/or redevelopment. As an example, expansion of existing residences on Lake Sammamish (allowed beyond 50-foot lake buffer and building setback will require an equal area of shoreline buffer enhancement with native vegetation.

3. Specific Strategies for Addressing Commonly Occurring Foreseeable Impacts

To supplement the general strategies described above, the proposed SMP contains specific policies and regulations that are geared toward the types of development and redevelopment activity that are expected to occur in Issaquah in the foreseeable future. In accordance with the shoreline guideline requirements (WAC 173-26-201.3.d.iii), this section describes the specific strategies for preventing cumulative impacts associated with “commonly occurring and foreseeable impacts”⁴ including impacts caused by:

- Unregulated activities,
- Developments that are exempt from a shoreline substantial development permit,
- Residential bulkheads, residential piers, and runoff from newly developed properties, and
- Platting or subdividing property and installation of infrastructure that could establish a pattern for future shoreline development.

Impacts from Unregulated Activities

The shoreline guidelines do not define “unregulated activities”, but for purposes of this analysis it is assumed this includes activities that occur without City review or approval (illegal activities) and activities that fall outside of the scope of the SMP (e.g., recreational boating on the lake not tied to associated shoreline development). Illegal activities are not expected to occur frequently or be widespread.

⁴ The shoreline guidelines’ require that the cumulative impacts analysis focus on these issues, see WAC 173-26-201.3.d.iii.

Moreover, the City monitors and enforces development actions to ensure that applicable regulations are followed; discrepancies can be addressed through enforcement provisions. Impacts caused by activities that fall outside the scope of the SMP are assumed to be minimal (e.g., normal maintenance of landscaping, etc) or else covered by other regulations, thus, they are not expected to have cause significant cumulative impacts

Also, the proposed SMP includes a statement that all development activity on lands or waters subject to the SMP must comply with the policies and regulations of the SMP regardless of whether the activity requires a shoreline permit or not. This establishes the expectation that all uses and developments will be submitted for review, which will mitigate the potential for unregulated activities that would cause cumulative adverse effects.

Impacts Caused by Developments that are Exempt from a Substantial Development Permit

Development and activities that are exempt from requirements for a shoreline substantial development permit are specified in WAC 173-27-040. The most common shoreline exemptions that can cause impacts include construction and expansion of single-family residences, construction and repair/modification of protective bulkheads for single-family residences, and construction and modifications of docks/piers. The SMP includes specific provisions to address and mitigate the impacts of development activity exempt from shoreline substantial development permits. The SMP is also specific regarding standards for additions and modification of existing development. The SMP is very clear that development qualifying for a shoreline exemption must still be reviewed for compliance with all policies, standards and requirements in the SMP (8.2.3). The City uses a permit tracking system (“TRAKiT”) which will be used to keep records or track all shoreline exemptions. The permit software has the capability to report and summarize all permit activity on an annual basis or within a specified timeframe. The sections below discuss the potential for impacts from exempt development, including; single-family residential development, residential bulkheads and piers.

Single-Family Residential Development

This section focuses on impacts associated with single-family residential development since new single-family residential development is not required to obtain a shoreline substantial development permit.

In Issaquah, the potential for cumulative impacts associated with single-family residential development is relatively low because: 1) the opportunity for new residential development is relatively low in most areas and 2) the SMP contains specific provisions to ensure that shoreline conditions following development will be no worse than the pre-development conditions. For example, the SMP requires that a protective, vegetated buffer area be maintained on all shorelines to protect shoreline functions and processes. The required buffers are as follows:

- Issaquah Creek and East Fork – 100 feet
- Lake Sammamish – 35 feet

All new structures and impervious surfaces must be located landward of the buffer plus a plus a 15-foot-wide building setback. The buffer applies to all environment designations and all uses (not just single-

family residential uses). The buffer must be retained in a naturally vegetated condition consistent with the critical areas requirements. Requiring new development to maintain such a wide buffer sustainably reduces the adverse effects that new development, including single-family residential development, can have on shoreline functions (other effects are mitigated through regulations for shoreline stabilization and impervious surface as described below).

In addition to requiring vegetated buffers, the SMP contains the following provisions to mitigate the potential effects of residential use on Issaquah Creek and the East Fork, including the following policies:

- 7.2.1.2 - Residential development should be designed to preserve existing shoreline vegetation, control erosion, protect water quality using best management practices, and to utilize low impact development techniques where appropriate.
- 7.2.1.3 - Accessory structures such as accessory dwelling units, swimming pools, sport courts and other structures should be located and designed to minimize impervious surface and be visually and physically compatible with adjacent shoreline features.
- 7.2.1.4 - New residential development should provide adequate building setbacks and natural vegetated buffers to protect and restore ecological functions and processes, to preserve views, and to minimize use conflicts.
- 7.2.1.5 - For additions to existing residential residences enhancement of ecologic conditions (ex: buffer vegetation, water quality) should be required commensurate to the proposed improvement or development.
- 7.2.1.6 - The City should encourage voluntary enhancement and restoration of high-functioning vegetated buffers and natural or semi-natural shorelines.
- 7.2.1.7. - Residential development should at a minimum achieve no net loss of ecological functions necessary to sustain shoreline natural resources, even for developments that do not require a Shoreline Substantial Development Permit.

The policies listed above are implemented by regulations which effectively mitigate potential effects of residential development on Issaquah Creek and the East Fork. Regulations on Lake Sammamish require enhancement of shoreline buffer vegetation with the expansion or additions to existing residences (6.1.3.5). To provide incentive to remove existing bulkheads and improve nearshore habitat, the SMP allows lakeshore buffers to be reduced (6.1.3.3). Opportunities for new residential development along Issaquah Creek and the East Fork are relatively scarce except in reaches in A, B, G, H and X (See discussion under Reasonably Foreseeable Future Development). These reaches tend to be the most ecologically intact and the highest functioning areas, so they are designated Urban Conservancy. Single-family residential developments are allowed in the Urban Conservancy area with a shoreline exemption permit from the City. In issuing the exemption permit, the City verifies that the proposed developments comply with the SMP policies and regulations, including the buffer requirements and all CAO requirements.

On the Lake Sammamish shoreline, there is limited potential for new residential development because there are only four lots that do not already have a residence (these lots are classified as vacant) (See discussion under Reasonably Foreseeable Future Development). Property owners wishing to construct a new residence on a vacant parcel would be required to locate all structures and impervious surfaces

landward of the 35-foot shoreline buffer plus the 15-foot building setback. In addition, property owners would be required to enhance 80 percent of the shoreline buffer area by planting native woody vegetation. This required enhancement activity will offset the impacts of the new development and prevent cumulative adverse effects on shoreline ecology.

Most of the residential development activity on Lake Sammamish will involve modification or expansion of existing single-family homes. For single-family residential additions greater than 500 SF, an equal area of shoreline buffer enhancement is required. Impacts of modification/expansion are discussed below under Impacts of Other Development Actions.

Residential Bulkheads and Piers

The SMP contains stringent rules for construction of new bulkheads and other forms of structural shoreline stabilization. The regulations establish a preference for “soft-shore” or bio-stabilization approaches which have less impact on near shore and instream processes and habitats.

On Issaquah Creek and the East Fork new, expanded, or replaced bank stabilization and flood control structures are only allowed when they are part of an approved project whose primary purpose is remediating hazardous substances, or when there is conclusive evidence, documented by a geotechnical analysis, that a primary structure is in danger of shoreline erosion caused by currents or waves and not caused by normal sloughing, vegetation removal, or poor drainage (7.1.3). New stream bank stabilization structures must incorporate features that minimize adverse effects on riparian habitat, salmon spawning and migration, and water quality. The approaches must be consistent with Washington Department of Fish and Wildlife bank stabilization guidelines.

Most of the Lake Sammamish shoreline lots already have some form of stabilization (see Table 3). Under the proposed SMP, new bulkheads and expansions of existing bulkheads on the lakeshore would be required to incorporate native vegetation, beach coves, incline gravel fill, large wood, rocks and other techniques that have been shown to mitigate the effects of bulkheads on shoreline ecology (6.1.4.3). The City will not approve new bulkheads, concrete walls, and similar hard structures that do not incorporate such features unless there is conclusive evidence that such structures are deemed necessary to protect and existing residences in danger of shoreline erosion caused by currents or waves and not caused by normal sloughing, vegetation removal, or poor drainage. Applicants are required to prove that there is a significant possibility that a home will be damaged within three years as a result of shoreline erosion if hard armoring measures are not implemented (6.1.4.4). To facilitate replacement of old and failing stabilization structures with newer more environmentally friendly approaches, the SMP specifies that replacement of more than seventy-five (75) percent of the lineal feet of an existing bulkhead within any five (5) year period be regulated as “new, expanded, or replaced” structures (6.1.4.6).

The SMP contains two additional requirements that are essential from preventing cumulative impacts of residential bulkheads: Subdivisions are required to be designed to assure that future development of the established lots will not require structural shoreline stabilization or further limit channel migration (6.1.2.9). Exceptions may be made for the limited instances where stabilization is necessary to protect allowed uses where no alternative locations are available and no net loss of ecological functions will result.

Also, use of a bulkhead, revetment or similar structure to protect a platted lot where no structure presently exists is prohibited.

The SMP prohibits piers and docks on Issaquah Creek and the East Fork, so there will be no cumulative impacts to the creeks as a result of piers or docks. Residential docks, piers, floats and lifts are abundant on the Lake Sammamish shoreline (see Table 3). According to the ICR, approximately 90 percent of shoreline parcels have a dock or similar moorage structure. The proposed SMP allows redevelopment or reconstruction of existing docks provided the redeveloped or replaced dock does not exceed the area of the existing dock or 500 SF (6.1.5.8), does not exceed a dock length of 70 feet or as needed to reach an 8-foot depth (6.1.5.7), and complies with Army Corps of Engineers and WDFW permit conditions. The SMP also prohibits moorage structures on Lake Sammamish from being located near known critical habitats including the mouths of Issaquah, Tibbetts, Lewis and Laughing Jacobs Creeks and wetlands. The SMP includes the following requirements to reduce and mitigate impacts of docks and piers:

- Open grating for 40% light transmittance (6.1.5.13);
- Minimizing diameter of piles and maximizing pile spacing (6.1.5.27b);
- Narrower dock widths (6.1.5.9)
- Shoreline vegetation enhancement (6.1.5.17)
- Non-toxic WDFW-approved materials (6.1.5.16)
- No skirting on moorage structures (6.1.5.14)

Stormwater and Water Quality

To mitigate effects of increased runoff, the SMP requires compliance with applicable storm water regulations and with zoning standards that limit the amount of new impervious surface to between 30 and 50 percent for residential development. Commercial and multi-family zoning standards presently limit impervious surface area to a maximum of 50% to 65% of the site area. There is a small commercial area within shoreline jurisdiction zoned Cultural and Business District (CBD) which allows up to 85% impervious surface area. The City's impervious surface limits are relatively low compared to other urban/suburban jurisdictions and this reduces stormwater runoff and fosters infiltration thereby minimizing impacts of runoff from development. The shoreline buffer standards are also effective at preventing impacts of increased runoff because buffer vegetation helps to trap sediments, sequester nutrients, and stabilize soils. The following regulations help prevent cumulative impacts caused by increased runoff:

- 5.5.2.1 - Shoreline use and development shall incorporate all known, available, and reasonable methods of preventing, controlling, and treating stormwater to protect and maintain surface and ground water quantity and quality in accordance with the City's Stormwater Management Policy (IMC 13.28), Basin Plan, Comprehensive Plan and other applicable laws.
- 5.5.2.2 - Best management practices (BMPs) for controlling erosion and sedimentation and preventing pollutants from entering shoreline waterbodies shall be implemented for all new uses/development in accordance with IMC 16.30 (Erosion and Sediment Control).
- 5.5.2.3 - All structures that may come in contact with water shall be constructed of concrete, steel, or other approved materials. Materials used for pilings, dock decking or other structural components shall be approved by applicable state agencies for contact with water to avoid discharge of pollutants from wave splash, rain, or runoff. Wood treated with creosote, copper

chromium arsenic or pentachlorophenol is prohibited in shoreline water bodies. ACZA treated wood must meet Post-Treatment Procedures.

Platting or Subdividing Property and Installing Infrastructure

Widespread subdivision of shoreline properties is not expected in Issaquah because of the existing development pattern and existing zoning regulations. It is possible that some of the large lots along the upstream and downstream reaches of the mainstem Issaquah Creek will be subdivided. These areas are designated Urban Conservancy, and the SMP requires that multi-family developments in the Urban Conservancy zones be located at least 200 feet landward of the ordinary high water mark. If these lands are platted for single-family development, new homes would be required to meet all of the standards of the SMP including the shoreline buffer standards. As such, cumulative impacts are not expected.

Potentials Impacts from Other Development Actions

Most of the development activity within the jurisdiction of the SMP will be modification or expansion of existing developments. The SMP generally requires some improvement of the existing conditions in exchange for expansion or modification of existing uses. For example, existing commercial and industrial structures may be expanded, repaired, remodeled, or renovated if the expansion is located landward of the standard shoreline buffer and building setback. Expansion of legally established commercial or industrial developemnts located wholly or partially within the standard buffer may not extend waterward of the existing foundation walls or existing impervious surface area. If the expansion involves greater than 500 square feet of new impervious surface area, the proponent must enhance an equal area of shoreline buffer with native woody vegetation (1:1 ratio).

On the Lake Sammamish shoreline, the proposed SMP requires enhancement of shoreline buffer vegetation in exchange for any modification or expansion of an existing legally establish residential structure within shoreline jurisdiction that increases the structure's footprint or impervious surface area by more than 500 square feet. Expansions and modifications are required to occur landward of the shoreline buffer and building setback unless that property owner removes an existing bulkhead and replaces it with natural softshore stabilization in accordance with Army Corps of Engineers and National Marine Fisheries Service standards for shoreline restoration. In such cases, waterward expansion is allowed provided that it is at least 25 feet landward of the ordinary high water mark.

Modifications and expansions of single-family developments are exempt from the substantial development permit requirements, however must still comply with SMP standards. During the permit process, the City will review the proposed development plans to ensure that the SMP regulations are met.

The SMP contains standards for non-conforming uses that are designed to improve shoreline conditions over time. Structures that are or have been used for non-conforming uses may be used for a different non-conforming use only upon the approval of a Shoreline Conditional Use permit. If a non-conforming use is discontinued for twelve (12) consecutive months or for twelve months during any two-year period, the non-conforming rights expire and any subsequent use or development must comply with the SMP. Non-conforming structures may be maintained, repaired, or altered provided it is not enlarged or intensified in any way that increases the extent of the nonconformity. Expansion of a non-conforming structure within shoreline buffers would require a shoreline variance. The policies and regulations related to non-

conforming structures and non-conforming uses in the shoreline are also consistent with the City's zoning code regulations and the standards established by WAC 173-27-080.

4. Role of the Restoration Plan in Preventing Cumulative Impacts

A Shoreline Restoration Plan has been prepared as part of the comprehensive SMP update. While the SMP designations, policies and regulations are the mechanisms for achieving no net loss of shoreline ecological functions, the purpose of the Restoration Plan is improve present shoreline ecological functions beyond current conditions.

The City of Issaquah has an ongoing program to acquire lands for stream and riparian areas restoration projects. City-identified and -funded capital improvement projects (CIP) have been the primary mechanism for stream restoration projects. But non-CIP projects have been funded and completed as well. The City has used funding from state and federal agencies and mobilized volunteers to accomplish many aspects of the restoration program.

Many of the restoration actions were made possible through City acquisition of streamside properties and removal of existing structures. The restoration activities have included channel widening for flood control; side channel creation; installation of bioengineered bank protection; culvert replacement; placement of LWD; removal of invasive species such as Himalayan blackberry and English ivy; and, in almost every project, planting of native riparian vegetation. Many of these projects receive on-going restoration and maintenance coordinated by the City's Resource Conservation Office. Since 1994, the City had completed approximately 30 restoration projects on City streams, 20 of which are associated with Mainstem Issaquah Creek.

The City of Issaquah has also made significant strides in identifying specific stream and habitat restoration projects that address the factors currently limiting shoreline ecological functions and habitat quality. The City's 2003 Stream Inventory provides a range of potential stream improvement opportunities and recommends site- or reach-specific projects that may restore and enhance fish habitat and other stream functions. The City also developed a Stream and Riparian Areas Restoration Plan (Watershed Company, 2006), which identifies 74 potential restoration projects.

In the Lake Sammamish shoreline, enhancing natural shoreline vegetation and improving fish passage within tributary streams along the eastern shoreline of Lake Sammamish are among the most important restoration opportunities that currently exist within the shoreline planning area. Other opportunities include removing failing docks and bulkheads and/or replacing with softshore alternatives where possible.

Consistent with state guidelines (WAC 173-26-186), the proposed SMP includes a new section establishing an overall restoration goal for the City, objectives to achieve the goal, and broad restoration actions to implement the objectives. The restoration goal, objectives, and actions were developed based on the baseline conditions of the shorelines as determined by the results of the Inventory and Characterization Report. The City's intent is to meet the no net loss standard, and result in an overall improvement to the condition of the habitat and resources within the shoreline jurisdiction of the City over time. The restoration goal, objectives and actions are summarized below in Table 6.

Table 8 Restoration Goal, objectives and Actions

RESTORATION GOAL: Maintain or restore shoreline functions and ecological processes that have been impaired as a result of past development activities

| Restoration Objectives | Categories of Restoration Actions | | | |
|--|-----------------------------------|------------------------------|--|--|
| | Enhance Riparian Vegetation | Add Large Woody Debris (LWD) | Restore/Create off-channel features and secondary channels | Remove / Replace or Reduce Shoreline Armoring and Overwater Structures |
| 1. Enhance In-stream and Nearshore Fish and Wildlife Habitat | ⊙ | ⊙ | ⊙ | ⊙ |
| 2. Restore Connection to Floodplain and Associated Wetlands | | | ⊙ | ⊙ |
| 3. Reduce Flood Hazards | ⊙ | ⊙ | ⊙ | ⊙ |
| 4. Restore Nearshore and Channel Complexity | | ⊙ | ⊙ | ⊙ |
| 5. Restore Natural Sediment Processes | | | ⊙ | ⊙ |
| 6. Improve Water Quality | ⊙ | | ⊙ | ⊙ |
| 7. Stabilize Eroding Streambanks | ⊙ | ⊙ | | ⊙ |
| 8. Control Invasive Species | ⊙ | | | |

In addition to the goal and objectives for restoration, the draft SMP Restoration Plan (ESA Adolfson, 2009) represents the shoreline restoration element of the SMP. The plan identifies opportunities for restoration activities or efforts that include programmatic opportunities (e.g. surface water management; low impacts development; water quality improvement; public education), site-specific opportunities (creek bank restoration, off-channel habitat creation, riparian vegetation enhancement), regional plans and policies for the Cedar Sammamish Watershed, and potential funding and partnership opportunities. The SMP's restoration planning is focused on areas where shoreline functions have been degraded by past development activities. The areas with impaired functions were identified in the City's Shoreline Inventory and Characterization. Recognizing that much impairment to shoreline processes and functions are the result of watershed scale activities beyond the jurisdiction of the shoreline master program or beyond the City's jurisdiction, the implementation of the Restoration Plan will improve shoreline ecological functions in the city over time.

VI. Conclusion

The development and use patterns along Issaquah's shorelines are well established. Opportunities for new residential development are limited, and therefore change within the shoreline will primarily be the result of redevelopment activities. The system of shoreline environment designations and use regulations in the proposed SMP is consistent with the established land use pattern, as well as the land use vision contained in the City's Comprehensive Plan, and enacted in the City's zoning code. Based on this consistency, it is unlikely that substantial changes in shoreline uses will occur in the future. One exception to that is public open space. The City currently owns a significant amount of legacy and undeveloped land along the creeks. Much of the land has been acquired with grant money that greatly limits development or improvements, in order to retain the natural open space for wildlife habitat. In general, improvements of these lands will include more public access and restoration and will result in a net improvement in shoreline functions.

The proposed SMP provides development standards and regulations for shoreline modifications and overwater structures that protect shoreline ecological processes. The standards and regulations are more restrictive of activities that would result in adverse impacts to the shoreline environment. The updated buffer and mitigation standards on the Lake Sammamish shorelines afford a greater opportunity to improve vegetation and ecological functions over time; restoration planning outlined in the Draft Restoration Plan provides the City with opportunities to improve or restore ecological functions that have been impaired as a result of past development activities. In addition, the proposed SMP is meant to compliment several city, county, state and federal efforts to protect shoreline functions and values.

In summary:

- A substantial portion of the Issaquah Creek shoreline area is owned by the City or other government agencies. Approximately 128 acres out of 296 acres (43%) is in public ownership and another 8% of the shoreline area is in existing right-of-way. Therefore, approximately 49% of the total shoreline area is privately owned, with 9.7% of the total shoreline area vacant, undeveloped land and 17% redevelopable.¹
- Most of the land in public ownership was acquired to protect critical area habitat and open space, and the Community Facilities zoning limits allowable development and uses. The public lands are included in the "Urban Conservancy" shoreline environment designation. The Urban Conservancy designation encompasses approximately 74% of the total shoreline planning area and approximately 49.5% of the Urban Conservancy lands are publically owned.. Restoration activities (such as shoreline armoring removal and habitat enhancement projects) are targeted to these areas. New development in these areas would include restoration projects and public access facilities.
- Changes in existing shoreline use patterns will be limited to primarily redevelopment. Under the proposed SMP, new residential development and substantial redevelopment would be required to meet creek and lake buffers and avoid the need for new shoreline stabilization. Additions/expansions to nonconforming structures are not be allowed to increase the current level of nonconformity without going through a shoreline variance process, and environmental improvements such as buffer enhancement or removal of bank armoring would be required. The

SMP also requires that where permitted development or redevelopment result in unavoidable impacts to shoreline ecological functions, mitigation is required to provide equivalent or better ecological functions. These measures ensure the “no net loss” standard would be met under the proposed SMP.

- Nearly all of the Lake Sammamish properties (excluding Lake Sammamish State Park) currently have docks or piers. Under the proposed SMP, new docks or replaced docks would be limited in size and would be required to include improvements in design and materials in compliance with the SMP, Army Corps of Engineers and WDFW standards.
- There are many opportunities for restoration actions to preserve or restore ecological functions. The City is actively implementing a restoration program on publically-owned properties which comprise a approximately 43% of the total shoreline area for the mainstem Issaquah Creek. By continuing to work together with regional, and state restoration programs (Puget Sound Partnership, WRIA 8, Mountains to Sound Greenway), implementation of restoration actions identified in the Restoration Plan would serve to improve ecological functions over time by enhancing or restoring areas with degraded functions.

Based on an assessment of these factors, the cumulative actions taken over time in accordance with the proposed SMP are not likely to result in a net loss of shoreline ecological functions from existing baseline conditions. In concert with implementation of restoration actions in the city, the regulatory provisions of the proposed SMP would serve to improve the overall condition of shoreline resources in the city.

References

- City of Issaquah. 1990. City of Issaquah Shoreline Master Program. Issaquah, Washington
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